Symmetric DSL services will be better capable of supporting interactive digital video and voice services, where high quantities of data need to be sent in both directions.

Incumbent LECs have generally only deployed ADSL technology, which does not provide as much upstream bandwidth as downstream. This is hardly a coincidence, given that ILECs have little incentive to deploy symmetric DSL services for less than $100 a month that would directly compete with their $1000-2000 per month T1 and frame relay services. In addition, as long as they are permitted to engage in line sharing only for their own DSL services, ILECs will favor ADSL because it permits them to leverage their lock on the residential voice market into a "free-ride" for their data services. ILECs cannot get "free loops" to support SDSL and IDSL, because those technologies do not preserve the below-4 khz analog band. Therefore, ILECs do not deploy those technologies.

As Joshi describes, ILECs are building into the process in which they provide data CLECs unbundled DSL loops several preferences for their "chosen" ADSL technology. The Commission's final spectrum management policy should outlaw these practices.

Binder Group Management. SBC has proposed a spectrum management program that utilizes "binder group management." A binder group is a collection of adjacent loops in the distribution plant, and, as Joshi points out, spectral interference is most troublesome in loops that are close to each other.

Binder group management appears sound in principle – the ILEC will "manage" the binder groups to make sure that the "noisy" (in their opinion, CLEC DSL) are segregated from incompatible formats. In practice, however, this policy limits the

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Undertaking a similar role for the deployment of advanced loop technologies is clearly consistent with the goal of "promot[ing] competitive alternatives in all communications markets." *Id.* at Section II.B.

deployment of DSL services by CLECs placing several binder groups "off limits." In addition, SBC utilizes its binder group management process to reserve "clean" binder groups for its own ADSL service and to prohibit CLEC DSL loops from being placed not only in that ADSL-binder group, but in adjacent binder groups (generally, up to six adjacent groups).

This practice causes several perverse results: (1) the ILEC retail ADSL service receives special treatment and receives the "cleanest" binder group; (2) CLEC DSL loops are segregated into spectrally "dirty" binder group ghettos, resulting in a degradation of the potential bandwidth on those CLEC loops; and (3) ILECs may actually reserve binder groups *in advance* of actual ADSL deployment, and therefore CLEC orders will be rejected even when the ILEC is not deploying any service themselves.

Finally, as Joshi discusses, even a binder group management system that addressed all of the above issues would not work. All binder group management proposals presume that loops stay in the same binder group as they travel from the neighborhood to the central office.[67] In reality, actual outside plant does not work this way, and binder group integrity is generally not maintained. Two recently-submitted papers to T1E1 by Bell Atlantic and Ameritech/Bellcore make this point readily clear.[68]

Loop "Pre-Qualification" Processes. The Commission should also be skeptical of loop "pre-qualification" processes, as deployed by Bell Atlantic. Bell Atlantic currently "pre-qualifies" loops for its own Infospeed ADSL service by utilizing a loop

67 This is referred to as "binder group integrity." Joshi Aff. at Section IV.

68 Bell Atlantic, "Binder Group Segregation is not Feasible," T1E1.4/99-018 (Feb. 1999); Bellcore & Ameritech, "Binder Group Fill," T1E1.4/00-021 (Feb. 1999); Joshi Aff. at Section IV.

information database that it has recently created. This pre-qualification process ostensibly takes into account spectral interference issues – but it does so only with regard to Bell Atlantic's chosen ADSL technology. When data CLECs like Covad attempt to order digital loops from Bell Atlantic, if the office has been "pre-qualified", the CLEC's order will be accepted or rejected based on whether Bell Atlantic's ADSL service would work over a loop to that end-user.

Not only is this process discriminatory (because it denies CLECs direct access to Bell Atlantic's loop information database), it makes no sense. Qualifying Covad's loops, on which the customer may choose SDSL or IDSL service, on the basis of whether Bell Atlantic's ADSL technology would work, is illogical. And if a CLEC wants to bypass this system (by ordering what Bell Atlantic now calls a "Digital Designed Loop"), it can cost thousands of dollars to get just one loop installed.[69]

Conclusion. As the above discussion reveals, ILECs cannot be trusted to act as neutral parties with regard to loop spectrum management practices. In the last year, ILECs have abused their control over the bottleneck local loop infrastructure to stall deployment by CLECs. As a result, the Commission's final spectrum management policy must deny the ILEC a veto power over deployment of innovative loop technologies.

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69 *See Ex Parte* Presentation of Covad Communications Company, CC Docket No. 96-98, June 3, 1999. Covad's June 3 *Ex Parte* attached a May 28, 1999 New York price schedule proposal from Bell Atlantic, which would impose a $204.32 "engineering work order charge", an $1811.41 charge for "removal of load coils", and a $943.79 charge for "removal of multiple bridge taps."

B. Covad's Spectrum Management Proposal

Covad proposes that the Commission's spectrum management policy take into account several substantive and procedural aspects. Covad encourages the Commission to seek counsel, pursuant to the Federal Advisory Committee Act, from representatives of the industry on an on-going basis. However, the Commission must step forward and retain ultimate authority over these issues – because no private body or company has the public interest mandate that the Commission possesses.

1. Definition of "Significantly Degrade"

Covad believes that the Commission should step back from its interim definition of "significantly degrade" and refocus on whether a particular signaling technology causes undue interference with other technologies; not on whether specific loops may suffer from interference. All DSL technologies cause some interference with other technologies and it is impossible to eliminate that reality. Instead, new rules should assure that deployed technologies do not exceed specific tolerable noise levels. Carriers must then design their services with the understanding that other carriers have been and will be deploying other acceptable DSL technologies in the outside plant.

The model described above results in the following two recommendations:

- A new technology is considered to "significantly degrade" the network when it causes more interference than existing technologies (not including T1 AMI signals) that are currently deployed on the loop plant.
- Particular loop technologies should be qualified or approved for deployment. Provided that all carriers have deployed technologies already qualified for deployment, no further dispute resolution process is necessary. The amount

of customer-specific interference should be limited and that which does occur should be addressed by the carrier providing service to that end-user.

This proposal takes the position that, in general, the level of spectral interference in the current local network (outside of T1 AMI) does not present any threat to service quality. All parties – ILECs and CLECs alike – should be able to stipulate to this fact in light of their actual experiences.

The second recommendation would remove the Commission, and indeed the state PUCs, from trying to assess blame when a particular service to any particular consumer is somehow degraded. The use of qualified loop technologies should keep these occurrences to a minimum. As a practical matter, neither the Commission nor state PUCs has the resources to handle disputes on an individual loop basis. More importantly, since several carriers will undoubtedly be deploying DSL services, there is no specific blame to be assessed if service to any particular customer is impaired. If a carrier's service to a particular customer cannot withstand tolerable noise, the carrier must revise its assumptions about the outside plant and change its deployment guidelines accordingly.

These recommendations would work so long as the Commission also adopts two sets of additional recommendations described in more detail below. First, the Commission should phase out unacceptably "noisy" technologies like T1 AMI from the plant, and the Commission should implement a quick non-discriminatory process for testing and qualifying new innovative technologies for deployment on the outside plant.

2. Immediate Ban on Current Technologies that Cause Significant Degradation

Covad agrees with the Commission's observation that analog T1 AMI cause considerable interference in the outside plant. As discussed in Section IV of the Joshi Affidavit, T1 AMI is the most significant cause of interference in the outside plant today. Indeed, T1 AMI is much "noisier" than any other technology – including DSL – being deployed or under serious consideration for deployment. Covad strongly supports the Commission's recommendation to discontinue future deployment of T1 AMI and phase out current deployment. These steps alone will make the outside plant more hospitable for future DSL deployment.

From a technical perspective, Covad sees no reason why all current T1 AMI lines cannot be migrated to one of the current DSL technologies, such as HDSL. However, Covad is not in a position to know the extent of current T1 AMI deployment throughout the country and therefore cannot comment on the cost associated with phasing out T1 AMI entirely.

3. Process for Qualifying New Loop Technologies for Deployment

As discussed above, by far the most important element of any spectrum management policy is to take the ultimate decision making power out of the hands of the ILECs. Covad believes that the presumptions of the current interim policy – deployment in any state without a record of substantial degradation, adoption by a generally-recognized industry standards body – should be continued in the final policy. For technologies already successfully deployed, Covad believes that the party seeking to deny use of a particular technology should have the clear burden of proving that the technology would cause substantial degradation, by substantial evidence. This would permit any party – not just the ILEC, but CLECs as well – from gaming this process.

With regard to a new loop technology for which no standard had been established, the Commission should establish a process for carriers to create actual, commercial field trials of that technology – without having to somehow persuade the resident incumbent LEC to consent to a trial of an innovative technology. Actual field experience with a technology is far superior to any lab test or calculation approach. As a result, the process of qualifying a new loop technology for deployment should incorporate a limited field trial to find out these facts.

Covad proposes the following process –

1. Any carrier (including the ILEC) seeking to deploy a new, non-standard technology would have to file an application for qualification for deployment with the Commission.
2. This application would include an affidavit and supporting calculations stating that the new technology does not appear to significantly degrade the network (i.e. pose a significant threat to the network), based on the "calculation based" approach to spectrum management.
3. Upon filing, this application will provide the carrier with the right to begin a limited commercial deployment of the new technology – in two different areas, with up to fifty central offices and up to 5,000 subscriber lines in each area. This limited commercial deployment authority will last no more than one year.

4. If the applicant is a CLEC, the ILEC in each of these areas must provide unbundled loops (as specified by the CLEC) to the CLEC on a nondiscriminatory, unbundled basis in order to facilitate the field trial.

5. During this limited commercial deployment, the applicant will maintain an "incident log" that details any complaints of interference that might be attributed to the new technology.

6. Six months after this limited commercial deployment begins, the applicant is permitted to apply to the Commission to demonstrate that the technology has been "successfully deployed."

7. The Commission will put the application on public notice and may refer it to a designated advisory committee (convened pursuant to the Federal Advisory Committee Act).

8. A final Commission decision as to whether the new technology "significantly degrades" other services will be made within nine months after the limited commercial deployment commences.

9. A Commission finding that the technology does not significantly degrade other services will have immediate national applicability.

Covad believes that this process is eminently fair and workable to all industry participants. It will provide CLECs a supervised process for field trials of new and innovative technologies without having to fight ILECs region-by-region. And ILECs will have the comfort that "renegade CLECs" will not be deploying noisy forms of DSL service without the ILEC knowing about that deployment. Finally, the process will facilitate the rapid deployment of new loop technologies that are designed to cause less noise than existing technologies.

C. Deploying Commission Resources

It is fortuitous that the Commission is undertaking a reorganization at the same time it is establishing a long-term spectrum management policy because that reorganization can take into account the special needs that the above process would require.

In particular, Covad anticipates that implementation of the loop technology qualification process described above would take place in the Commission's new Enforcement Bureau. In that regard, the Commission should –

- Ensure that the Enforcement Bureau has enough appropriate engineering expertise, by outside hiring or by drawing resources on the current resources of the Office of Engineering and Technology, the Office of Plans and Policy, and the Common Carrier Bureau.
- Have a Commission engineer(s) regularly attend T1E1 and other industry standard meetings, to keep abreast of technological developments and to ensure that progress in those bodies is not intentionally stalled by any class of carrier.
- Convene, on a quarterly basis, a Loop Technology Advisory Committee, that would, like the North American Numbering Committee, meet to review technological developments, reports of spectral interference, and pending field trials before the Commission. A senior Commission engineer should chair the Advisory Committee. Membership to this Advisory Committee should be as

open as possible, and should include qualified technical representatives from ILECs, CLECs, IXCs, ISP, consumer groups, and state regulatory commissions. The Commission should use this Advisory Committee to review facts regarding pending field trials, but the Commission, consistent with the Federal Advisory Committee Act, must still retain final authority over approving technologies for deployment.

* * *

Covad believes that the process described above would facilitate the rapid deployment of new and innovative technologies to consumers. The process is balanced, because it would not favor the technology of *any* service provider. CLECs and ILECs would enjoy, for once, true "parity of opportunity" to provide new services to their customers.

IV. CONCLUSION

In this proceeding, the Commission has consistently acted to establish a framework in which competitive carriers deploying xDSL technologies will operate on a nondiscriminatory basis with incumbent LECs. By ordering DSL line sharing in this proceeding, the Commission will set the stage for near-immediate availability of competitive broadband xDSL services to millions of small business and mass market residential consumers across the nation.

DSL line sharing and spectrum management are two critical pieces necessary to ensuring that CLECs have nondiscriminatory access to the ILEC network. Ordering ILECs to provide DSL line sharing will remove a pernicious form of discrimination in which ILECs provide shared lines to themselves and their preferred ISP resellers, but deny that functionality to CLECs. And establishing a well-designed final spectrum management process will promote true parity, because it would remove the ILEC's current "veto power" over deployment of new and innovative types of DSL technology by CLECs like Covad.

It is imperative that the Commission act swiftly on these matters. ILECs are trying to lock up the market for DSL services by offering steep discounts, long-term contracts and shared lines to their preferred ISP resellers at terms that CLECs cannot currently match because of the ILECs' refusal to provide line sharing. At the same time, ILECs are developing and putting into place spectrum management programs designed to promote the xDSL flavor of the ILEC's choice (ADSL), to the detriment of other xDSL flavors that other CLECs are deploying in response to consumer demand.

Making nondiscriminatory access a reality and not just a theoretical construct that need only be enshrined a Commission Order – it will also require vigilant enforcement. CLECs must not simply possess "rights without remedies." As a result, the Commission's DSL line sharing and spectrum management rules must be developed and implemented in a manner that will promote the rapid, competitive deployment of advanced services to small business and residential consumers.

Respectfully submitted,

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Dated: June 15, 1999

ATTACHMENT 1

AFFIDAVIT OF ANJALI JOSHI

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147
	)	
	)	

AFFIDAVIT OF ANJALI JOSHI

I. WITNESS QUALIFICATIONS

1. My name is Anjali Joshi. Since March 1998 I have been Covad's Director of Network Engineering, responsible for all engineering activities involved in the planning and implementation of Covad's networks and services. I have extensive experience designing and building carrier class networks for voice and data. Prior to joining Covad, I was at AT&T, where I managed the implementation of several services including AT&T's InterSpan ATM service. I have Masters degrees in Engineering Management and Computer Engineering and a Bachelor's degree in Electrical Engineering.

II. LINE SHARING IS TECHNICALLY AND OPERATIONALLY FEASIBLE

2. Line sharing is technically feasible – the ILECs are already sharing the telephone line for providing both voice and data services. The FCC has asked for comment relating to operational procedures and processes that will enable CLECs to share lines with the ILECs. In my testimony, I will describe:

- The concept of line sharing

- How line sharing is technically implemented
- How line sharing can be implemented in the central office
- The operational process that will allow CLECs to share lines with ILECs.

A. Line sharing

3. Data and voice signals can be simultaneously carried on the same copper line using different parts of the frequency spectrum. Analog voice uses frequencies from 0 Hertz up to about 3,400 Hertz and ADSL uses the spectrum above 30 kHz. The spectrum between 4 and 30 kHz is an unused buffer between the DSL and voice bands. The two frequency bands are separated using low pass and high pass filters in the Central Office and at the customer premises. The high frequency ADSL signal is sent to the DSL Access Multiplexers (DSLAM) at the central office and the DSL modem at the customer location. The low frequency signal is sent to the voice switch in the central office and the telephone handset at the home. This frequency division enables an end user to purchase DSL service while continuing to receive analog, circuit-switched POTS from the incumbent LEC.

4. Line sharing requires equipment at both the end user premises and the serving central office to implement the high and low pass filter functions. The customer premise equipment is typically a POTS splitter that may be installed near the network interface device ("NID"). The POTS splitter implements the low pass filter function which separates the POTS signal and sends it through the internal wiring to the telephone handset. The high pass filter function is implemented within the modem line card and allows the higher frequency ADSL signal to be separated and processed by the DSL modem.

5. The signals carrying POTS and ADSL information must also be separated at the central office end. While a POTS splitter at the end-user premises separates signals carried over a single local loop, POTS splitters deployed at the central office typically handle multiple loops. A central office POTS splitter is connected to the main distribution frame (MDF). A cross-connect takes the loops from the MDF to the POTS splitter. The POTS splitter separates the frequencies used by POTS from the frequencies used by ADSL and routes the POTS signal to the voice switch. The ADSL signal is separated from the voice signal by the high pass filter in the DSLAM line card. Typically Central Office POTS splitters have only the low pass filter function; the high pass filter function is integrated into the Central Office DSLAM modems.

6. Today, ILECs employ this regime in their single line, voice and ADSL offerings. The POTS splitter, the DSLAM, and the voice switch are all owned and operated by the ILEC. In a line sharing environment, the technical configuration is the same; the only significant difference is the ownership and the location of the equipment. In fact, line sharing may be the same as current practice in cases where the ILEC voice and data business units are separate and operate like two independent service providers.

B. Line Sharing is Technically Feasible

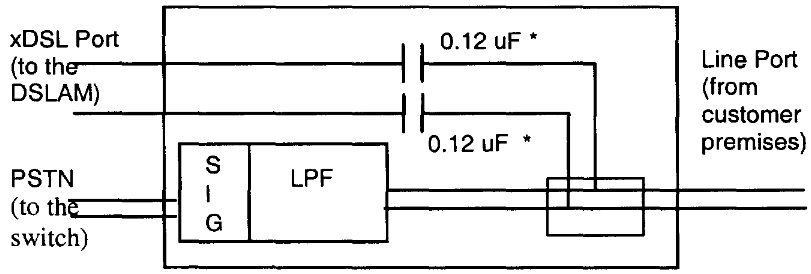
7. Line sharing can be implemented between multiple service providers just as it is implemented by the ILECs today between their voice and data service units. The spectrum on the line can be divided between providers such that the consumer has a

choice of service providers for data service and voice service provided over the same loop to the home.

8. The technical implementation of line sharing is known and well understood. The POTS splitter used to split the frequency band is defined in ANSI standards and is available from most DSLAM equipment vendors. The splitting function consists of a high pass filter and a low pass filter. The purpose of the High Pass Filter is to protect the ADSL signals from the high frequency transients (ringing/ring trip) that accompany the operation of voice services. The Low Pass Filter protects the voice services from the non-linear effects of ADSL signals. POTS splitter functions are defined for both the central office (CO) and the Remote (customer premises) locations. At the Remote as well as the CO location, the low pass filter function is implemented externally in a POTS splitter and the high pass filter function is typically implemented internally in the modem.

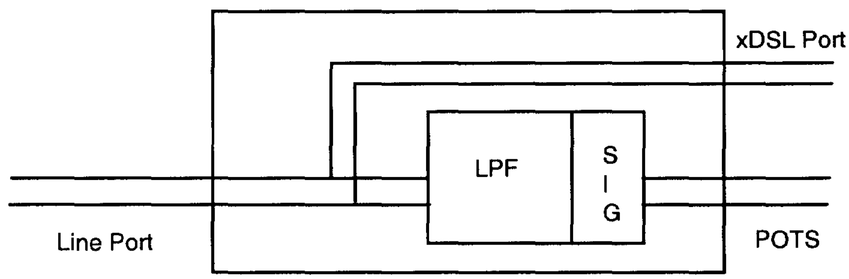
9. The CO and remote POTS splitter functions are defined in Annex E of the T1.E1 Issue 2 standard for ADSL DMT. They are illustrated in the following diagrams (Figure 1 and Figure 2).

Figure 1 - External POTS Central Office Splitter



NOTE – (*) These capacitors are for the external POTS Splitter without the HPF function only. Internal Splitter function or external splitters with a complete HPF function may incorporate this capacitance in the input to the HPF function. The D.C. blocking capacitors are optional on splitters integrated within the equipment closely associated with the ATU-C.

Figure 2 – Remote external POTS Splitter



C. Implementation of Line sharing

10. I describe two methods for implementing line sharing. Both of those methods are technically feasible, but I recommend one as being superior from an engineering and operations point of view. The two methods are:

- Common Shared Splitter Bank
- Connection Bridged at the MDF

I recommend the Common Shared Splitter bank option.

11. **Common Shared Splitter Bank:** This solution proposes the use of a common splitter bank that can be shared between multiple service providers.

12. The ILEC may install a common bank of POTS splitters in the central office that could be shared among multiple service providers. This bank of POTS splitters should be pre-wired to the Main Distribution Frame. When a CLEC orders "shared line" service to an existing POTS subscriber, the customer's loop would be cross-connected through an available splitter. The voice pair out of the splitter is then connected to the pair going to the voice switch, and the DSL pair is connected to the pair going to the DSL service provider's equipment. The ILECs may choose to use this capability or continue to use their present arrangement.

13. **Connection Bridged at the MDF**: Since most DSLAM implementations today incorporate the High Pass Filter function into the modem, they can be directly bridged to the loop coming in from the outside plant on the Main Distribution Frame. The MDF cross connects the same customer premises loop to the POTS splitter. The voice pair output from the POTS splitter is then connected to the voice switch.

14. In this implementation, when a customer orders a CLEC data service on the line that is being used for voice service, that line will be bridged at the MDF to the CLEC's DSLAM. The same line will also be connected through the POTS splitter to the voice switch.

15. The connection between the POTS splitter and the MDF acts like a bridged tap on the ADSL line. This puts a constraint on the location of the POTS splitters. To prevent impairments to the ADSL transmission the distance between the POTS splitter and the MDF must be quite small (approximately 100 feet or less). I believe that this presents a significant operational constraint that may prevent this

solution from being feasible in some central offices. Thus, as a general matter, I recommend the common shared splitter bank approach outline above.

D. Line Sharing Process

16. Line sharing requires the installation of POTS splitters, and the accompanying cross-connections at the MDF. To prepare a central office for line sharing, the ILECs need to do the following:

- Install a sufficient number of POTS splitters.
- Cable these POTS splitters to the Main Distributing Frame, in groups, as described below:

– ADSL Ports: POTS splitter output port going to the DSLAM

– PSTN Ports: POTS splitter output port going to the voice switch.

– Line (subscriber) Ports: POTS splitter input port for loops from MDF.

17. To add CLEC ADSL service to a line that has existing ILEC POTS service, the ILEC modifies the existing MDF cross-connects as follows:

- *The ILEC allocates a line in a POTS Splitter.*
- *The ILEC connects that POTS Splitter circuit in series with the existing line, in these steps:*

– **Disconnect the incoming loop from the line to the voice switch.**

– **Connect the foregoing incoming loop to the POTS splitter input port.**

– **Connect the POTS splitter DSL output port to the line going to the CLEC DSLAM.**

– **Connect the POTS Splitter voice output port to the line going to the voice switch.**

E. Customer Premises POTS Splitter

18. Line-sharing does not affect how POTS splitters are used at the customer end of the loop. Combined POTS and ADSL service over a single loop appears the same at the customer end of the loop, whether the ILEC provides both POTS and ADSL, or the ILEC provides only POTS and a CLEC provides ADSL.

F. Conclusion

19. ILECs use line sharing today to provide their own ADSL service. mplementing line sharing for multiple service providers is both technically and operationally feasible. Just as the unbundling of the local loop required certain operational changes, this will require some modifications to current methods and procedures.

20. Line sharing will increase customer options for service and will foster healthy competition among service providers. The FCC should mandate that line sharing be implemented.

III. SPECTRUM MANAGEMENT ISSUES

A. The Spectrum Management Policy Must Accommodate multiple DSL technologies.

1. Covad currently deploys SDSL, ADSL and IDSL technologies in its network to deliver broad coverage and choice of speeds to its customers. We also continually monitor and plan to deploy new technologies to broaden our service offerings and meet customer needs in different market segments.

2. There are many DSL technologies implemented by vendors today using a variety of coding techniques and signal processing algorithms. The different implementations result in differences in range limitations, bandwidth, symmetry/asymmetry and the ability operate with POTS or ISDN service on the same loop.

3. All DSL technologies are reach-limited to varying degrees. Vendors are constantly implementing new and improved signal processing techniques to extend the reach of their systems. Additionally the reach of some DSL technologies can be extended through the use of repeaters.

4. Technologies may be symmetric or asymmetric. Symmetric technologies (IDSL, HDSL) support the same upstream and downstream rates. [70] Symmetric services are preferred by businesses that need high bandwidth in both the upstream and downstream directions. For instance they may use a symmetric service to connect servers to host their web sites. Symmetric service is also important for customers who want to use high bandwidth pipes for integrated voice and data applications.

[70] Upstream refers to data traveling away from the customer's home or office towards the central office. Downstream refers to data traveling toward the home or office.

5. The asymmetric technologies available today are designed to provide a high downstream rate and a low upstream rate. They operate over the existing voice service using the frequency band above that used to transmit and receive voice signals. These technologies were initially designed to serve video on demand applications but are being used primarily for Internet access by residential users.

6. The data rate of the available DSL technologies varies from 144Kbps symmetric for IDSL to 52 Mbps for VDSL downstream. Other technologies support various rates within this range.

7. Higher access bandwidth needs generated by internet applications, and increased processing power available on silicon, is driving DSL equipment vendors to build more efficient technologies that increase the data rate and extend the reach. Emerging technologies are increasing options for service delivery and are more spectrum efficient. Covad believes it is critical for the FCC to adopt a spectrum policy that will allow service providers like Covad to deploy a variety of DSL technologies and rapidly bring emerging technologies to market.

8. All the major incumbents have been focused on an ADSL strategy so far. The major DSL CLECs have, in addition to ADSL, deployed SDSL, IDSL as well as other technologies such as MVL. The Commission should be wary of incumbents trying to promote ADSL over other technologies with the excuse that the others are non-standard. The ILECs have several incentives to prefer ADSL that have no legitimate business basis. First, until the FCC orders line sharing, the ILECs have a competitive advantage with respect to ADSL because they have local monopolies on POTS service. Second, SDSL competes with the ILECs' own symmetric T1 and ISDN services. Third, future digital

voice services will undoubtedly utilize new symmetric technologies opening up the ILEC's dominance in the local voice business to future competition. Consequently, any spectrum management the FCC adopts should consider and attempt to protect the broad range of DSL services and technologies that the market demands.

B. The Final Standard Must Assume Tolerable Levels of Interference

9. Just like all electromagnetic radio frequencies interfere with one another, all DSL signals interfere with other DSL signals. There are currently multiple DSL technologies deployed on the loop plant, all of which cause some interference on neighboring loops. The degree of interference depends upon various factors such as physical proximity of loops, overlap in the frequency band, and transmitted power.

10. When the standards bodies developed the specifications for ADSL they assumed the existence of interference in the loop plant and did not require any special loop management practices. ISDN and HDSL were designed to tolerate interference from neighboring loops carrying DSL signals. Historically ILECs have never implemented any special deployment restrictions for DSL technologies.

11. The FCC should require carriers who deploy service over the common loop plant to factor in reasonable levels of interference when defining the operating parameters of their services. Just as it does for radio spectrum, the Commission's task should be to develop policies and procedures to administer the deployment of DSL technologies to allows the co-existence of multiple DSL technologies in the loop plant.

C. Spectrum Management Policies should enable new technologies to be deployed on the loop plant

12. Covad is the nation's first DSL CLEC. When Covad began deploying its DSL services in California on December 8, 1997, no one opposed the introduction of these new services. At that time SBC did not raise any "spectrum" concerns when Covad introduced ADSL, SDSL and IDSL to California customers for the first time. However as Covad tried to extend its deployment to other SBC states, SBC refused to permit Covad to deploy SDSL in Texas with the excuse that it was non-standard. Fortunately, the FCC understood that allowing incumbent LECs the authority to dictate spectrum policies would stifle the deployment of innovative competitive technology (at para. 63), and the FCC issued its March 31, 1999 Order. That order allows Covad to deploy SDSL in Texas, a service that it already successfully deployed in other states.

13. While the March 31, 1999 Order resolves the issues of services that have already been "successfully deployed", it does not discuss how the new generation of technologies should be introduced.

14. DSL is on everyone's radar screen today and both ILECs and CLECs are racing to make their DSL plans. Vendors are continually developing new and improved technologies with increased reach and reduced interference characteristics. These technologies may not conform to existing standards and are unlikely to be standardized quickly. The ILEC view on preventing the deployment on non-standard technologies is extremely counter-productive since the newer technologies are better designed and will enable more efficient use of the loop plant.

15. The incumbents claim that new technologies should not be allowed on the loop plant since they are non-standard and do not have defined characteristics. According to